Appl. No. 09/764,163
Amdt. dated April 16, 2007
Reply to Office Action of December 15, 2006

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. - 79. (Canceled)

80. (Currently amended) A polypeptide consisting essentially of:

a first and a second interactor domain, and a circularly permutated TEM-1 β-lactamase protein;

wherein the first interactor domain binds to a single ligand, and the first interactor domain is selected from the group consisting of an antibody, an antigen, a first monomer of a hetero-dimerizing helix, a second monomer of a hetero-dimerizing helix, a receptor, and a scaffold peptide;

wherein the second interactor domain binds to said single ligand, and the second interactor domain is selected from the group consisting of an antibody, an antigen, a first monomer of a hetero-dimerizing helix, a second monomer of a hetero-dimerizing helix, a receptor, and a scaffold peptide;

wherein the first interactor domain is fused to the circularly permutated β-lactamase protein through the N-terminal ~~breakpoint~~ break-point of the circularly permutated β-lactamase protein ~~and~~ and the second interactor domain is fused to the circularly permutated β-lactamase protein through the C-terminal ~~breakpoint~~ break-point of the circularly permutated β-lactamase protein,

wherein said N-terminal break-point and said C-terminal break-point are within 10 amino acids in either direction from a junction of 2 amino acid residues located between alpha-helices 7 and 8 of said TEM-1 β-lactamase protein,

wherein said circularly permutated TEM-1 β-lactamase protein is functionally reconstituted only upon binding of said first interactor domain and said second interactor domain to ~~a~~ said single ligand.

81. - 83. (Canceled)

84. (Currently amended) The polypeptide of claim 80, wherein said N-terminal ~~break-point~~ break-point and said C-terminal ~~break-point~~ break-point are within a solvent exposed loop between elements of secondary structure within the β-lactamase protein.

85. (Currently amended) The polypeptide of claim 80, wherein said circularly permutated β-lactamase protein consists of amino acids 26 to 288 of the following sequence prior to circular permutation:

His Pro Glu Thr Leu Val Lys Val Lys Asp Ala Glu Asp Gln Leu Gly
26 30 35 40
Ala Arg Val Gly Tyr Ile Glu Leu Asp Leu Asn Ser Gly Lys Ile Leu
45 50 55
Glu Ser Phe Arg Pro Glu Glu Arg Phe Pro Met Met Ser Thr Phe Lys
60 65 70
Val Leu Leu Cys Gly Ala Val Leu Ser Arg Ile Asp Ala Gly Gln Glu
75 80 85
Gln Leu Gly Arg Arg Ile His Tyr Ser Gln Asn Asp Leu Val Glu Tyr
90 95 100 105
Ser Pro Val Thr Glu Lys His Leu Thr Asp Gly Met Thr Val Arg Glu
110 115 120
Leu Cys Ser Ala Ala Ile Thr Met Ser Asp Asn Thr Ala Ala Asn Leu
125 130 135
Leu Leu Thr Thr Ile Gly Gly Pro Lys Glu Leu Thr Ala Phe Leu His
140 145 150
Asn Met Gly Asp His Val Thr Arg Leu Asp Arg Trp Glu Pro Glu Leu

155 160 165
Asn Glu Ala Ile Pro Asn Asp Glu Arg Asp Thr Thr Met Pro Val Ala
170 175 180 185
Met Ala Thr Thr Leu Arg Lys Leu Leu Thr Gly Glu Leu Leu Thr Leu
190 195 200
Ala Ser Arg Gln Gln Leu Ile Asp Trp Met Glu Ala Asp Lys Val Ala
205 210 215
Gly Pro Leu Leu Arg Ser Ala Leu Pro Ala Gly Trp Phe Ile Ala Asp
220 225 230
Lys Ser Gly Ala Gly Glu Arg Gly Ser Arg Gly Ile Ile Ala Ala Leu
235 240 245
Gly Pro Asp Gly Lys Pro Ser Arg Ile Val Val Ile Tyr Thr Thr Gly
250 255 260 265
Ser Gln Ala Thr Met Asp Glu Arg Asn Arg Gln Ile Ala Glu Ile Gly
270 275 280
Ala Ser Leu Ile Lys His Trp
285
(SEQ ID NO: 2);

~~wherein said N-terminal breakpoint and said C-terminal breakpoint are within 10 amino acids of an amide bond junction between two amino acids selected from the group consisting of asparagine 52 and serine 53, leucine 91 and glycine 92, glutamine 99 and asparagine 100, proline 174 and asparagine 175, glutamic acid 197 and leucine 198, lysine 215 and valine 216, alanine 227 and glycine 228, and glycine 253 and lysine 254~~.

86. (Canceled).

87. (Previously presented) The polypeptide of claim 85, wherein the break-point is between said two amino acids are glutamic acid 197 and leucine 198.

88. (Previously presented) The polypeptide of claim 80, wherein said ligand is a protein ligand.

89. (Canceled).

90. (New) The polypeptide of claim 80, wherein when said first interactor domain is an antibody, said second interactor domain is a first monomer of a hetero-dimerizing helix, and said ligand is an antigen-second monomer of hetero-dimerizing helix fusion protein, wherein the antibody specifically binds to the antigen; or

when said first interactor domain is an antibody, said second interactor domain is a first monomer of a hetero-dimerizing helix, and said ligand is a second monomer of hetero-dimerizing helix-antigen fusion protein, wherein the antibody specifically binds to the antigen; or

when said first interactor domain is an antigen, said second interactor domain is a first monomer of a hetero-dimerizing helix, and said ligand is an antibody- second monomer of hetero-dimerizing helix fusion protein, wherein the antigen specifically binds to the antibody; or

when said first interactor domain is a first monomer of a hetero-dimerizing helix, said second interactor domain is an antigen, and said ligand is an antibody-second monomer of hetero-dimerizing helix fusion protein, wherein the antigen specifically binds to the antibody.

91. (New) The polypeptide of claim 90, wherein said first monomer of a hetero-dimerizing helix and said second monomer of a hetero-dimerizing helix are selected from the group consisting of c-fos and c-jun.

92. (New) The polypeptide of claim 90, wherein the antibody is an scFv.

93. (New) The polypeptide of claim 90, wherein the antigen is selected from the group consisting of a receptor protein and a scaffold peptide.

94. (New) The polypeptide of claim 80, wherein said first interactor domain is a scFv antibody, said second interactor domain is a jun helix monomer, and said ligand is an antigen-fos helix fusion protein, wherein the scFv specifically binds to the antigen.

95. (New) The polypeptide of claim 80, wherein said first interactor domain is a scFv antibody, said second interactor domain is a jun helix monomer, and said ligand is a fos helix-antigen fusion protein, wherein the scFv specifically binds to the antigen.

96. (New) The polypeptide of claim 80, wherein said first interactor domain is an antigen, said second interactor domain is a jun helix monomer, and said ligand is a scFv antibody-fos helix fusion protein, wherein the antigen specifically binds to the scFv antibody.

97. (New) The polypeptide of claim 80, wherein said first interactor domain is a fos helix, said second interactor domain is an antigen, and said ligand is a scFv antibody-jun helix fusion protein, wherein the antigen specifically binds to the scFv antibody.